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HELMINTHS IN DOGS IN JAPAN

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82—IIJIMA, T., HOSAKA, Y., SASAKI, T. & AKIYAMA, S., 1958. [Yamanashi Prefectural Medical Research Institute, Kofu, Japan.] [A survey of schistosome infection in dogs in endemic area of Yamanashi Prefecture.] *Japanese Journal of Parasitology*, 7 (1), 74-77. [In Japanese: English summary p. 77.]

Out of 462 dogs from the endemic schistosomiasis area in Yamanashi Prefecture, 118 (25.5%) were proved positive for eggs of *Schistosoma japonicum* by faecal examination. No significant difference was found between the sexes. The incidence of the infection gradually increased with age. The infection rate in the northern hilly district was 32.6% and in the southern plain district 20.6%.
Y. Yamao

1785—ITO, J., WATANABE, K., NOGUCHI, M., MOCHIZUKI, H. & MAEKAWA, T., 1958. [Hygiene Laboratory, Faculty of Education, Shizuoka University, Shizuoka, Japan.] [An investigation of the helminth parasites of dogs in Shizuoka Prefecture. I. General aspect.] *Japanese Journal of Parasitology*, 7 (6), 674-679. [In Japanese: English summary p. 679.]

192 dogs were examined post mortem for helminths from July 1956 to July 1957, in Shizuoka Prefecture. The combined parasitic rate was 100% and 14 species were found. The average number of species found in one dog was 2.5 and the maximum number of species harboured was six. The species most frequently found were: *Ancylostoma caninum*, *Dipylidium caninum*, *Dirofilaria immitis* and *Trichuris vulpis*. *Paragonimus* was mostly prevalent in the western part of the Prefecture.
Y. Yamao

84—NAKAMURA, H., 1958. [Suita City, Osaka, Japan.] [Treatment of canine filariasis by introduction of Fuadin, Bayer, into the right ventricle.] *Journal of the Japan Veterinary Medical Association*, 11 (11), 564-566. [In Japanese.]

Five dogs with proved filariasis were treated with foudadin by injecting it directly into the right ventricle. 1/1 gauge and 7.5 cm. length needles were used. The first injection was 2 c.c., the second 3 c.c., the third 3 c.c. to 5 c.c. with an interval of three to seven days between each injection. No serious side effect was observed. Symptoms due to filariasis subsided relatively rapidly and the general condition improved.
Y. Yamao

625—OISHI, I., KOBAYASHI, S. & KUME, S., 1958. [On the parasitic conditions of canine filariae.] *Journal of the Japanese Veterinary Medical Association*, 11 (1), 10-12. [In Japanese.]

Dogs were examined in the Tokyo district for filarial infection. 59.1% of them were found to have filariae. Among these, 81.2% were infected with both male and female worms, and the rest with either sex. In the former case, the average number of adult worms was 12 with equal numbers of males and females, while in the latter, the number of worms found averaged 1.9 with five males to every six females. The immature form was found from the end of November to early March, and 37.7% of the infected dogs were found to have the immature worms during these months.
Y. Yamao

626—OISHI, I. & KUME, S., 1958. [Studies on the diagnosis of canine filariasis. I. An induction method with Spatoinin.] *Journal of the Japanese Veterinary Medical Association*, 11 (2), 69-72. [In Japanese.]

The technique of induction of microfilariae into the blood stream by the use of Spatoinin was examined. A dose of 30 mg. per kg. body-weight followed by blood examination 30 minutes later was found to be most satisfactory.
Y. Yamao

1784—ISHIHARA, K., SUGANUMA, Y. & SAKAI, T., 1959. [Department of Medicine, School of Veterinary Medicine, University of Gifu, Naka P. O., Japan.] [Effect of 1-bromo-naphthol-(2) on intestinal parasites of dogs.] *Journal of the Japan Veterinary Medical Association*, 12 (1), 8-12. [In Japanese: English summary p. 12.]

1-bromo-naphthol-(2) at 200 mg. per kg. body-weight was effective against canine hookworm infection when it was given twice or three times between meals. When it was administered at the rate of 100 mg. per kg. or more, canine ascarids were completely expelled. Canine whipworm eggs were reduced in the faeces when the drug was administered at the rate of 200 mg. per kg. twice between meals. It was ineffective against canine tapeworms, even when the dose was as much as 1,500 mg. per kg.
Y. Yamao

195—ISHII, T., 1959. [Department of Parasitology, National Institute of Health, Tokyo.] [Studies on larva migrans. 1. On the stage of the infective dog Ascaris larvae.] *Japanese Journal of Parasitology*, 8 (2), 204-208. [In Japanese: English summary p. 208.]

The moulting of larvae of *Toxocara canis* and morphological details associated with it were studied. Larvae were infective at the second stage which appeared on the tenth to fourteenth day of culture, when moulting took place inside the egg capsule.
M. Yoshida

196—ITO, J., WATANABE, K., NOGUCHI, M., MOCHIZUKI, H. & MAEKAWA, T., 1959. [Hygiene Laboratory, Faculty of Education, Shizuoka University, Japan.] [An investigation of the helminth parasites of dogs in Shizuoka Prefecture. 2. *Toxocara canis* and *Ancylostoma caninum*.] *Japanese Journal of Parasitology*, 8 (1), 13-18. [In Japanese: English summary p. 18.]

In Shizuoka, dogs were infected by *Toxocara canis* and *Ancylostoma caninum* at a rate of 6.8% and 84.9%, respectively. *T. canis* was found at a higher rate in young dogs (less than one year old). In the case of *A. caninum*, a lower rate of infection and a smaller number of worms per dog were found in winter than any other season. Reliability of stool examination was 46.6% for *T. canis* and 97.8% for *A. caninum*.
M. Yoshida

197—ITO, J., WATANABE, K., NOGUCHI, M., MOCHIZUKI, H. & MAEKAWA, T., 1959. [Hygiene Laboratory, Faculty of Education, Shizuoka University, Japan.] [An investigation of the helminth parasites of dogs in Shizuoka Prefecture. 3. *Trichuris vulpis*, *Dirofilaria immitis* and *Spirocerca sanguinolenta*.] *Japanese Journal of Parasitology*, 8 (2), 155–159. [In Japanese: English summary p. 159.]

The correlation indices between the infection rates of *Trichuris vulpis* and *Dirofilaria immitis* and the age of dogs infected were +0.5 and +0.7, respectively, the rate being higher than 30% in both. *Spirocerca lupi* was found in three dogs out of 192 examined. M. Yoshida

1786—ITO, J., WATANABE, K., NOGUCHI, M., MOCHIZUKI, H. & MURAKAMI, M., 1959. [Hygiene Laboratory, Faculty of Education, Shizuoka University, Shizuoka, Japan.] [An investigation of the helminth parasites of dogs in Shizuoka Prefecture. 4. Trematodes.] *Japanese Journal of Parasitology*, 8 (4), 453–457. [In Japanese: English summary pp. 456–457.]

Four species of trematodes, *Paragonimus westermani*, *Metagonimus yokogawai*, *M. yokogawai* var. *takahashii* and *Pseudoheterophyes continua* major, were identified from 192 dogs examined in Shizuoka Prefecture during 1956–57. Ten cases of *P. westermani* were found but the infection seemed to have no correlation with the age or sex of the dog. Only one case of *Pseudoheterophyes continua* major was recognized, while the *Metagonimus* infection (both *M. yokogawai* and *M. yokogawai* var. *takahashii*) showed an infection rate of 23.3%.

Y. Yamao

63—ITO, J. ET AL., 1959. [Hygiene Laboratory, Faculty of Education, Shizuoka University, Shizuoka, Japan.] [An investigation of the helminth parasites of dogs in Shizuoka Prefecture. Cestodes.] *Japanese Journal of Parasitology*, 8 (5), 649–654. [In Japanese: English summary p. 654.]

Five species of cestodes were recovered from 192 dogs in Shizuoka Prefecture in the period 1956–57. The species and their infection rates were as follows: *Dipylidium caninum* 45.7%, *Taenia taeniaeformis* 6.8%, *Diphylobothrium mansonii* 3.6%, *T. pisiformis* 0.5% and *Mesocostoides litteratus* 0.5%.

Y. Yamao

1196—KUROKAWA, K., 1959. "Surgical treatment of canine filariasis." *Japanese Journal of Veterinary Science*, 21 (4), 231–240. [Japanese summary pp. 238–239.]

The author explains his surgical technique for removal of the worms from the right heart or the pulmonary artery. Y. Yamao

1741—NODA, R., 1959. "A report on the experimental prenatal infection with *Toxocara canis* (Werner, 1782) in the dog." *Bulletin of the University of Osaka Prefecture. Series B. Agriculture and Biology*, 9, 77–82.

Three pregnant bitches kept in worm-free kennels were given infective *Toxocara canis* eggs by stomach

tube shortly before the birth of their puppies. No prenatal infection was found in the 2 puppies born 18 hours after infection of their mother. However, a few prenatally-acquired larvae in the early stages of development were recovered from the 3 puppies born 2½ days after infection of their mother; in contrast, Douglas & Baker, 1959 [see *J. Parasit.*, 45 (4, Sect. 2), 43–44] reported that at least 14 days are required for the larvae to invade the tissues of the uterus and foetus. Many prenatally-acquired larvae in various stages of development were recovered from the 4 puppies born 5 days after infection of their mother. J.W.S.

1539—TAGUCHI, M., TAKEHARA, B. & URIU, I., 1959. [Laboratories Division, Kanagawa Prefectural Health Department, Yokohama, Japan.] [Aberrant *Dirofilaria immitis* in the lateral ventricles of the brain in a dog.] *Journal of the Japan Veterinary Medical Association*, 12 (10), 430–432. [In Japanese: English summary p. 432.]

Adult worms of *Dirofilaria immitis* were seen in the lateral ventricles of the brain of a dog which died with rabies-like symptoms. The symptoms and anatomico- and histo-pathological findings are given. Y. Yamao

1532—FUKAMACHI, H., 1960. [Clinical Department, Research Institute of Endemics, Nagasaki University, Nagasaki, Japan.] [Experimental studies on the periodicity of microfilariae. 1. Provoking effect of stress stimuli upon the migration to the peripheral circulation of microfilariae.] *Endemic Diseases Bulletin of Nagasaki University*, 2 (1), 27–38. [In Japanese: English summary pp. 37–38.]

In dogs infected with *Dirofilaria immitis*, a considerable increase in the number of microfilariae in the peripheral circulation in the daytime was found to be caused by an application of electro- and cardiazol-shock, by a subcutaneous injection with acetylcholine or pilocarpine, and by an intravenous injection with communin. Other chemical stimuli did not affect the microfilarial count. Fukamachi concluded that the microfilarial periodicity was probably due to a parasympathetic stimulation in the host. Y. Yamao

1533—KATAMINE, D., YOSHIMURA, O. & SAKAGUCHI, Y., 1960. [Clinical Department, Research Institute of Endemics, Nagasaki University, Nagasaki, Japan.] [Experimental studies on the periodicity of microfilariae. III. Influence of artificial hypothermia of the host upon the migration of microfilariae to the peripheral blood.] *Endemic Diseases Bulletin of Nagasaki University*, 2 (3), 203–211. [In Japanese: English summary p. 211.]

The authors have shown that when the temperature of dogs infected with *Dirofilaria immitis* is artificially lowered for a period of 48 hours there is a loss of microfilarial periodicity and decrease in the numbers in the peripheral circulation. On the fifth day after the experiment, circulating microfilariae had increased in number and had resumed their normal nocturnal periodicity. The effectiveness of diethylcarbamazine and acetylcholine in provoking peripheral microfilariae was demonstrated even in a dog whose temperature was experimentally lowered. Y. Yamao

1568—KIKUCHI, S., SHIBAUCHI, D. & TSUKADA, T., 1960. [Studies on hookworm. II. Canine ancylostomiasis and the histological changes due to their biting into the intestinal wall.] *Journal of Veterinary Medicine*. Tokyo, No. 282, pp. 723, 725-726. [In Japanese.]
In a study of canine hookworms the females were found to bite more deeply into the host's intestinal wall than did the males, both feeding on intestinal tissues and blood. Granules of iron pigment were found in the digestive tract and in some body tissues of the hookworms. The worms caused superficial erosion of the mucosa as well as its thickening, hyperaemia, haemorrhage and atrophy or destruction of the intestinal glands, cell infiltration and necrosis. These histological changes were supposedly caused by mechanical irritation and toxins excreted by the worms. Y.Y.

820—KUME, S. & KUROKAWA, A., 1960. [Canine filariasis.] *Journal of the Japan Veterinary Medical Association*, 13 (1), 7-11. [In Japanese.]
Kume & Kurokawa review canine filariae and canine filariasis and give 54 references. Y.Y.

821—KUME, S. & KUROKAWA, K., 1960. [Diagnosis and treatment of canine filariasis.] *Journal of the Japan Veterinary Medical Association*, 13 (1), 35-38. [In Japanese.]

1570—KUROKAWA, K., UMEMOTO, H., TAKATORI, M. & TSUCHIYA, Y., 1960. [Effect of supatonin injection on canine filariasis.] *Journal of Veterinary Medicine*. Tokyo, No. 282, pp. 732-736. [In Japanese.]

1153—NODA, R. & NODA, S., 1960. [Experiments on removal of canine whipworms with phthalofyne.] *Journal of the Japan Veterinary Medical Association*, 13 (12), 530-533. [In Japanese: English summary p. 533.]
From their observations, the authors conclude that phthalofyne, given orally at 250 or 300 mg. per kg. body-weight, was a safe, effective anthelmintic against canine whipworms. Y.Y.

1155—OHISHI, I., KOBAYASHI, S. & KUME, S., 1960. [Effects of dithiazanine iodide on canine filariasis.] *Journal of the Japan Veterinary Medical Association*, 13 (6), 252-256. [In Japanese: English summary p. 256.]

From the results observed, Ohishi *et al.* concluded that the oral administration of dithiazanine iodide at 0.5 mg. per kg. body-weight per day, or the intravenous administration of 0.5 mg. per kg. per day appeared to be a practical dosage for removing microfilariae from dogs without any side effects. There was no evidence of any filaricidal effect on adult worms. Anthelmintic activity was not demonstrable against common intestinal parasites by intravenous administration. Its oral administration, however, resulted in the elimination of whipworms and hookworms. Y.Y.

1156—OKOSHI, S. ET AL., 1960. [Anthelmintic effect of oral administration of dichlorophen (Dicestal) tablets on *Dipylidium caninum*.] *Journal of the Japan Veterinary Medical Association*, 13 (2), 59-61. [In Japanese: English summary p. 61.]

Dichlorophen tablets showed a high anthelmintic action against *Dipylidium caninum* in a dog, at a dosage of about 500 mg. per kg. body-weight. In a toxicity experiment, only one of eight dogs, to which as much as 2,000 mg. per kg. were given, showed temporary diarrhoea. The drug also showed some anthelmintic action against canine ascarids, but not against other intestinal helminths, such as *Ancylostoma caninum* and *Trichuris vulpis*. Y.Y.

2327—OKOSHI, S. & TAKASHIO, M., 1961. [Occurrence of *Toxascaris leonina* (Nematoda: Ascaridae) and its artificial infection in dogs.] *Journal of the Japanese Veterinary Medical Association*, 14 (12), 513-518. [In Japanese: English summary p. 517.]

Toxascaris leonina in dogs in Tokyo may previously have been misidentified as *Toxocara canis*. Dogs were successfully infected with *Toxascaris leonina*, eggs appearing in the faeces 48 to 88 days later. [From English summary.] H.H.W.

46—TERAUCHI, J. ET AL., 1961. [A case of spontaneous infection with *Paragonimus miyazakii* in a dog.] *Japanese Journal of Parasitology*, 10 (3), 386-397. [In Japanese: English summary pp. 394, 397.]

Terauchi *et al.* report a case of canine paragonimiasis. They identified the lung fluke as *Paragonimus miyazakii*. Y.Y.

312—YOKOGAWA, M. ET AL., 1961. "Chemotherapy of paragonimiasis with bithionol. I. Experimental chemotherapy on the animals infected with *Paragonimus westermani* or *P. ohirai*." *Japanese Journal of Parasitology*, 10 (2), 302-316. [Japanese summary p. 316.]
Yokogawa *et al.* tested 2,2'-thiobis (4,6-dichlorophenol) (bithionol) in the chemotherapy of dogs and rats experimentally infected with *Paragonimus westermani* and *P. ohirai*. The administration of 50 mg. per kg. or 100 mg. per kg. body-weight, given 10 to 15 times on alternate days, proved to be most effective. Toxic manifestations were not found at these dose rates. Y.Y.

1169—YOKOGAWA, M. ET AL., 1961. [Chemotherapy of paragonimiasis with bithionol (Bithin). I. Experimental chemotherapy on animals infected with *Paragonimus westermani* or *P. ohirai*.] *Journal of Chiba Medical Society*, 37 (1), 16-28. [In Japanese: English summary p. 2.]

The numbers of eggs of *Paragonimus westermani* or *P. ohirai* passed per day in the faeces of infected dogs and rats decreased quickly after two or three administrations of 100 mg. of bithionol per kg. body-weight. Significantly fewer worms survived in the treated groups

than in the control groups. Pathological changes in the lungs of animals treated with bithionol were localized and inflammatory reactions around the cysts were very mild compared with those in the control group. The internal organs of the worms recovered from treated animals were generally atrophied or degenerated, atrophy or necrosis of the parenchyma cells of the reproductive organs being especially noticeable. Loose stools or diarrhoea always occurred at the first or second administration of bithionol but these symptoms disappeared without treatment and no serious histopathological changes were observed in the parenchymatous organs of the treated animals. T.Y.

2301—IJIMA, T., ITO, Y., NAKAYAMA, S. & YAMASHITA, H., 1962. [Survey of schistosome infection of dogs in the endemic area of Yamanashi Prefecture. II.] *Jap. J. Parasit.*, 11 (6), 478-482. [In Japanese: English summary p. 482.]

Nearly 5% of 683 dogs were positive for schistosome eggs with the greatest infection rates occurring in the Kamanashi district (up to 26%). The infection rate in male dogs (7.11%) was significantly different from that in females (2.08%). These figures are much lower than those from a similar survey in 1954, showing that preventative measures had been effective. [From English summary.] T.Y.

2304—NAGAHANA, M. ET AL., 1962. [Experimental studies on oral infection with *Necator americanus*. II. Infection of puppies with *N. americanus* larvae through the mucous membrane of the mouth.] *Jap. J. Parasit.*, 11 (6), 488-498. [In Japanese: English summary p. 498.]

Infective larvae of *Necator americanus*, placed on the mucous membrane in the mouths of puppies, underwent a normal tissue migration and matured within 51 to 56 days. [From English summary.] T.Y.

1863—NAGATA, M. & YAMADA, K., 1962. [Caparsolate sodium in the treatment of canine filariasis.] *J. Jap. vet. med. Ass.*, 15 (3), 94-98. [In Japanese: English summary pp. 97-98.]

Caparsolate sodium in intravenous doses of 0.4 mg. per kg. body-weight daily for 15 days, 0.8 mg. per kg. daily for 3 days or 0.8 mg. per kg. 4 times every other day eliminated adult heartworms within 30 days from 25 dogs with asymptomatic to severe clinical infections. [From English summary.] T.Y.

1607—SAKO, S. & YAMANE, O., 1962. [Studies on filarial dermatitis of the dog. I. Elephantiasis in infected and non-infected dogs.] *J. Jap. vet. med. Ass.*, 15 (3), 90-93. [In Japanese: English summary p. 93.]

3 types of elephantiasis-like skin disease are described from dogs infected with *Dirofilaria* and from uninfected animals and are differentiated from chronic eczema. It is doubtful if there is any relationship between these skin lesions and filarial infection. [From English summary.] T.Y.

1608—SAKO, S. & YAMANE, O., 1962. [Studies on filarial dermatitis of the dog. II. Effects of filaricides and comparison of body functions in dermatitis and dirofilariasis.] *J. Jap. vet. med. Ass.*, 15 (5), 172-176. [In Japanese: English summary p. 176.]

Following treatment trials involving 43 dogs with dermatitis, 24 with filariasis and 11 normal dogs, the correlation between skin lesions and dirofilarial infection is discussed. Arsenic compounds had no effect on the dermatitis, antimony treatment gave inconclusive results and antihistamine caused transitional improvement. Liver and kidney dysfunction resulting from dirofilarial infection is not believed to cause the dermatitis. [From English summary.] T.Y.

1612—TOMODA, I., 1962. [Serum protein changes in canine filariasis. II. Liver dysfunction.] *J. Jap. vet. med. Ass.*, 15 (12), 481-485. [In Japanese: English summary p. 485.]

The Gros test was positive in *Dirofilaria*-infected dogs with increased plasma globulin and decreased albumin and the Takaka test was positive in severe cases with ascites but not in asymptomatic carriers or controls. The effects of sodium antimony tartrate, carbon tetrachloride and tetrachloroethylene on serum protein of infected dogs and the correlation between serum protein changes and liver dysfunction are discussed. [From English summary.] T.Y.

2617—KUROKAWA, K., ICHIKI, H., KOMATSU, K. & OKUDA, H., 1963. [Shock in dogs caused by diethylcarbamazine.] *J. Jap. vet. med. Ass.*, 16 (9), 329-334. [In Japanese: English summary p. 334.]

Of 343 dogs given 5 to 10 mg. per kg. body-weight of diethylcarbamazine by mouth, 7 showed transient salivation and vomiting and 6 became severely shocked and died. These 6 dogs had filariae in the blood but constituted only 5% of all those with filariasis. It is recommended that diethylcarbamazine be used only in uninfected dogs to prevent filariasis and that consecutive daily doses should be 11 to 22 mg. per kg. [From English summary.] D.W.L.

1606—NAGAHANA, M., TANABE, K., ISHIKAWA, M., OKADA, S. & TAKAHASHI, Y., 1963. [Experimental studies on oral infection of *Necator americanus*. IV. Experimental infection of puppies with *N. americanus* larvae through the mucous membrane of oesophagus and small intestine.] *Jap. J. Parasit.*, 12 (5), 382-386. [In Japanese: English summary p. 386.]

Infective larvae of *Necator americanus* inoculated into the lumen of the oesophagus and the upper part of the small intestine of pups were not recovered from any tissue at autopsy, suggesting that infection can occur only through the oral mucosa. [From English summary.] T.Y.

2626—NODA, R., NODA, S., HORIE, M. & NOMURA, M., 1963. [Anthelmintic effect of a thenium preparation on canine hookworms and ascarids.] *J. Jap. vet. med. Ass.*, 16 (8), 285, 292-296. [In Japanese: English summary p. 285.]

Ancaris was given to dogs at dose rates of two-thirds of a tablet in a split dose to 3 tablets according to their weight (480 gm. to between 10 and 15 kg.) in a trial against hookworms and ascarids. The treatment removed about 85% of hookworms, between 75 and 96% of ascarids and 9.8% of whipworms. [From English summary.] D.W.L.

2305—OKOSHI, S., KITANO, N., TAKASHIO, M., USUI, M. & MURATA, Y., 1963. [Additional case report on *Toxascaris leonina* infection in dogs, and experimental treatment of the

infection.] *J. Jap. vet. med. Ass.*, 18 (2), 63-68. [In Japanese: English summary pp. 67-68.]

Toxascaris leonina is reported in 2 Tokyo dogs. Routine treatments with a piperazine compound and a diphenthan-toluene complex were effective. Experimentally infected dogs were effectively treated with routine doses of tetrachlorethylene, *n*-butyl chloride and a piperazine compound. A review of literature on helminthological surveys in Japanese dogs is given and the authors express the opinion that several reports of *Toxocara canis* ought to refer to *Toxascaris leonina*. [From English summary.] D.W.L.

1604—KIKUCHI, S. & OKUYAMA, Y., 1964. [Studies on trichuriasis. I. Ecological study on *Trichuris vulpis* and histopathological changes caused by it.] *Jap. J. Parasit.*, 13 (1), 11-24. [In Japanese: English summary p. 24.]

The ecology and pathology of *Trichuris vulpis* was studied at autopsies and in histological sections from 14 naturally infected dogs. [From English summary.] T.Y.

564—OHISHI, I., KOBAYASHI, S. & KUME, S., 1964. [Clinical application of dichlorophenarsine hydrochloride in the treatment of canine filariasis.] *J. Jap. vet. med. Ass.*, 17 (12), 603-608. [In Japanese: English summary p. 608.]

Filariasis in 236 dogs was treated with dichlorophenarsine hydrochloride in doses of 0.75 mg. active ingredient per kg. body-weight on 2 consecutive days. Vomiting, nausea and shock occurred within 30 min. in 51.6 and 36.9% of the dogs following the 1st and 2nd injections respectively; 1.2% were shocked and 0.8% died. No liver dysfunction occurred. Pulmonary embolism occurred one to 2 weeks later in 28.9% of the dogs and 7.6% died; 20.8% mortality occurred during a 4-month period beginning in November. During the 2 months following treatment 1.9% of dogs in stage I of the disease died, 5.6% in stage II, 7.0% in stage III and 53.3% in stage IV. [From English summary.] T.Y.

2328—SHIBATA, S., 1964. [Experimental studies on the periodicity of microfilariae. V. Influence of artificial collapse of lung upon the microfilarial periodicity of dog heart worm, *Dirofilaria immitis*.] *Endemic Diseases Bulletin of Nagasaki University*, 6 (4), 221-230. [In Japanese: English summary pp. 229-230.]

Artificial pneumothorax in dogs infected with *Dirofilaria immitis* caused variations in microfilarial counts and a shift in the time of peak counts, but no significant effect on nocturnal periodicity was observed. [From English summary.] J.W.S.

2250—KOBAYASHI, S., OHISHI, I. & KUME, S., 1965. [Evaluation of an organic phosphorus preparation (JSR-381) of low toxicity for removal of canine filariae.] *J. Jap. vet. med. Ass.*, 18 (2), 64-67. [In Japanese: English summary p. 67.]

Dogs infected with *Dirofilaria immitis* were treated with 5 consecutive courses of O, O-dimethyl-O-1, 2-dibromo-2, 2-dichloroethyl phosphate (JSR-381) at 5-day intervals. Each course consisted of 5 consecutive daily doses of 16.7 mg. per kg. body-weight given before a meal. Microfilarial counts decreased during treatment but subsequently increased and adult worms were not affected. Side effects included diarrhoea, vomiting, anorexia and depression. [From English summary.] T.Y.

2276—OHISHI, I., KOBAYASHI, S. & KUME, S., 1965. [Effect of long-term daily administration of diethylcarbamazine dihydrogen citrate on canine filariae.] *J. Jap. vet. med. Ass.*, 18 (4), 244-247. [In Japanese: English summary p. 247.]

Dogs with filariasis were given 11 to 22 mg. per kg. body-weight diethylcarbamazine dihydrogen citrate for 15 to 207 consecutive days. Microfilarial counts decreased during treatment but subsequently increased and adult worms were not affected. [From English summary.] T.Y.

2274—NODA, S. ET AL., 1965. [Prevention of canine filariasis by long-term daily administration of diethylcarbamazine.] *J. Jap. vet. med. Ass.*, 18 (8), 427-429. [In Japanese.]

5744—NODA, S. ET AL., 1965. [Anthelmintic effect of dithiazanine iodide on parasites in the digestive tract of the dog.] *J. Jap. vet. med. Ass.*, 18 (10), 626-628. [In Japanese.]

5745—NODA, S. ET AL., 1965. [Removal of parasites from the large intestine of dogs by intravenous injection of phthalofsyne.] *J. Jap. vet. med. Ass.*, 18 (12), 698-703, 706. [In Japanese: English summary p. 706.]

Dogs with ascarids and other parasites were treated with 200, 250, 600 and 1,000 mg. per kg. body-weight of phthalofsyne. Injections of 200 and 250 mg. per kg. removed 69 and 92% of parasites from the large intestine, respectively. Side effects were minimal, but dogs severely infected died after medication. The drug must be injected slowly, over a period of at least one minute. Doses of 600 mg. per kg. resulted in marked ataxia, vomiting and decrease in body temperature; a dose of 1,000 mg. per kg. was fatal. Blood indices and blood pressure were normal throughout the tests. [From English summary.] P.S.G.

947—SHIBATA, S., 1965. [Experimental studies on the periodicity of microfilariae. VI. Antemortem studies of distribution of microfilariae in the body.] *Endem. Dis. Bull. Nagasaki Univ.*, 7 (1), 1-11. [In Japanese: English summary pp. 1-2.]

Using 12 dogs infected with *Dirofilaria immitis* the author studied (i) the distribution of microfilariae in the lung capillaries, pulmonary artery and vein, chambers of the heart, aorta, inferior vena cava, femoral artery and vein and ear-lobe capillaries, (ii) the periodicity of microfilariae in the pulmonary blood vessels and in the peripheral blood and (iii) the effect of transplantation of an infected lung into an uninfected dog. [From English summary.] S.W.

948—SHIBATA, S., 1965. [Experimental studies on the periodicity of microfilariae. VII. Influence of controlled respiration of the host upon the microfilarial periodicity of *Dirofilaria immitis*.] *Endem. Dis. Bull. Nagasaki Univ.*, 7 (2), 114-129. [In Japanese: English summary pp. 114-115.]

6 control dogs were anaesthetized for 24 hr. and no change in the periodicity of *Dirofilaria immitis* microfilariae was noted. 6 dogs under hyperpressure respiration for 24-48 hr. showed a plateau curve for density of microfilariae in the peripheral blood, and 6 dogs undergoing hyperventilation showed immediate increase in the number of microfilariae in the peripheral blood and a loss of nocturnal periodicity. [From English summary.] T.Y.

959—YOSHIMURA, K., 1965. "On the trematode species *Phocitrema fusiforme* Goto and Ozaki, 1930 and *Cryptocotyle lingua* (Creplin, 1825)." *Jap. J. vet. Res.*, 13 (2), 15-18.

Phocitrema fusiforme and *Cryptocotyle lingua* were recovered from the small intestines of dogs on Rebun Island, Hokkaido, Japan. The worms are briefly described and the possible route of infection for each species is discussed. M.B-B.

5679—KUROKAWA, K. ET AL., 1966. [A proposed method for the administration of dithiazanine iodide in enteric coated tablets.] *J. Jap. vet. med. Ass.*, 19 (3), 94-99. [In Japanese: English summary p. 99.]

The reason for the decreased anthelmintic efficacy of enteric coated tablets of dithiazanine iodide against intestinal nematodes of dogs, compared with the conventional method, was investigated. The decrease was due to the rate at which the tablet travelled from the stomach to the small intestine, this being dependent on the time of the dog's last meal. It is recommended that the dose should be one tablet per 5 kg. body-weight given at noon to dogs fasted in the morning, repeated for 3 to 5 days. [From English summary.] P.S.G.

5680—KUROKAWA, K. ET AL., 1966. [A report on the surgical treatment of canine filariasis complicated with pericardial diaphragmatic hernia.] *J. Jap. vet. med. Ass.*, 19 (5), 200-203, 208, 216. [In Japanese.]

5725—MISAKA, T., KUMAGAI, R., MOCHINAGA, T. & NAOI, Y., 1966. [Clinical experience in the surgical treatment of canine filariasis.] *J. Jap. vet. med. Ass.*, 19 (9), 488-491. [In Japanese: English summary p. 491.]

1627—TANAKA, H., OHSHIMA, S. & INAMI, Y., 1966. [Studies on heartworm and intestinal helminth parasites in stray dogs.] *Jap. J. Parasit.*, 15 (6), 490-494. [In Japanese: English summary p. 494.]

134 stray dogs from the Toda-machi area, Japan, were autopsied. 59.7% had *Dirofilaria immitis* infection and 99.25% intestinal helminthiasis. The prevalence of *Ancylostoma caninum* was 91.04%, *Trichuris vulpis* 78.36%, *Toxocara canis* 5.22%, *Dipylidium caninum* 66.42% and *Diphyllbothrium mansonii* 0.75%. In 50% of dogs *A. caninum*, *Trichuris vulpis* and *Dipylidium caninum* were found together and in 85% of dogs there were 2 or more species present. *D. caninum* showed a higher prevalence in autumn and winter. Correlations were found between the number of female *Dirofilaria immitis* and the density of microfilariae in the blood, and also between the number of adult *A. caninum* and *T. vulpis* in the gut and the number of ova passed. [From English summary.] P.S.G.

5743—NODA, R. ET AL., 1966. [Efficacy of methyridine as an anthelmintic for dogs.] *J. Jap. vet. med. Ass.*, 19 (6), 228-233, 239. [In Japanese: English summary p. 239.]

In a test of the anthelmintic efficacy of Promintic (methyridine) against helminths of dogs, *Trichuris vulpis* was almost completely removed with a dose of 36 mg. of active ingredient per kg. body-weight administered subcutaneously on the lateral side of the thigh. The drug showed high efficacy against *Ancylostoma caninum* at 135 mg. per kg. and some action against *Dirofilaria immitis* at 200 mg. per kg.

repeated after 16 days. Efficacy against *Toxocara canis*, *Dipylidium caninum* and *Diphyllbothrium erinacei* was low or absent at 200 mg. per kg. However, at doses of over 75 mg. per kg. side effects were significant. Intraperitoneal or intramuscular injection produced significant side effects at even lower dosages. [From English summary.]

P.S.G.

135—HONGO, K. ET AL., 1967. [*Dirofilaria immitis* in the spinal cavity of a dog.] *J. Jap. vet. med. Ass.*, 20 (9), 381, 401. [In Japanese.]

150—HORIE, M., NODA, R., NODA, S. & OKUMURA, H. 1967. [Studies on *Strongyloides* sp. obtained from the dog.] *Jap. J. Parasit.*, 16 (6), 447-457. [In Japanese: English summary p. 457.]

Larvae of a nematode, apparently of the genus *Strongyloides*, recovered from a puppy in Osaka, Japan, are described. 20 to 10,000 filariform larvae obtained by the filter paper culture technique were inoculated subcutaneously into 15 dogs. Faecal examinations first became positive for larvae between 9 and 14 days later and continued positive for 60 days after inoculation. Larvae were obtained earlier in puppies than in dogs more than 6 months old. Dogs more than one year old were not infected. 1,000 filariform larvae were injected subcutaneously into mice. The number of larvae recovered from the internal organs, muscles and blood decreased steadily following inoculation, but they were still present after 30 days. Immature female worms were found in the intestine at 8, 12 and 17 days after inoculation. From these observations the nema todewas believed to be *Strongyloides stercoralis*. [From English summary.] M.R.N.S.

2120—KANDA, T., TASAKA, S. & SASA, M., 1967. "The effects of diethylcarbamazine treatment on the viability of microfilariae ingested by intermediate hosts." *Jap. J. exp. Med.*, 37 (2), 149-155.

Results of experiemnts with *Litomosoides carinii* in cotton-rats, *Dirofilaria immitis* in dogs and *Wuchereria bancrofti* in man have shown that in the initial stage of treatment with diethylcarbamazine at least some of the microfilariae of all 3 species could develop to metacyclic, infective larvae in the intermediate hosts even after being exposed to considerable doses of the drug in the vertebrate host. With *W. bancrofti* microfilariae, small doses of the drug demonstrated a reduction in the number and rate of the development of metacyclic larvae and a retardation of larval growth in the intermediate host. In experiments with *L. carinii* and *D. immitis*, the development to metacyclic larvae was not affected even by larger doses than usual. This was probably because the effects of the drug on microfilariae were masked by high tolerance of the parasites, and by the high densities of the parasites in the blood.

[A.S.] S.W.A.

1612—KITAYAMA, H., OHBAYASHI, M., SATOH, H. & KITAMURA, Y., 1967. [Studies on parasitic granuloma in the dog.] *Jap. J. Parasit.*, 16 (1), 28-35. [In Japanese: English summary p. 35.]

80 stomachs and 55 tongues of 132 stray dogs from Hokkaido, Japan, were examined histologically. The small granulomatous foci found in many cases were caused either by foreign bodies, *Toxocara canis* larvae or by other unidentified larvae. Though it was not proved that the unidentified larvae were of *Anisakis* type, all infected dogs came from seaside areas. Later a typical case of canine parasitic granuloma was investigated. 3 larval *Terranova* sp. and 2 larval *Contracaecum* sp. were found in stomach lesions. It is concluded that nematodes other than *Anisakis* must be considered in studies of parasitic granuloma. (12 photomicrographs.) [From English summary.]

P.S.G.

420—KUME, S., OHISHI, I. & KOBAYASHI, S., 1967. "Prophylactic therapy against the developing stages of *Dirofilaria immitis*: supplemental studies." *Am. J. vet. Res.*, 28 (125), 975-978.

The efficacy of diethylcarbamazine for prophylactic therapy against the infective larvae of *Dirofilaria immitis* was examined in dogs. Continuous administration of 3.1 mg. per kg. body-weight in the diet for 7 months (commencing 2 months before experimental infection) was highly effective in preventing development and migration of the larvae. The administration of diethylcarbamazine dihydrogen citrate at 5.5 mg. per kg. in capsules either daily or on alternate days for 60 days produced results which were statistically effective. When given daily for one month there was a reduced degree of infection.

K.H.

1583—OKOSHI, S. & USUI, M., 1967. "Experimental studies on *Toxascaris leonina*. I. Incidence of *T. leonina* among dogs and cats in Japan." *Jap. J. vet. Sci.*, 29 (4), 185-194. [Japanese summary p. 193.]

Of 2,964 dogs examined at the Veterinary Hospital, Tokyo, Japan, from 1958 to 1966, 9.62% harboured *Toxocara canis* and 1.27% *Toxascaris leonina*. Of 100 cats examined in 1965 and 1966, 17 were infected with *Toxocara cati* and 5 with *Toxascaris leonina*. It is suggested that imported animals were the main source of *T. leonina* infection. D.A.Cz.

2773—OKOSHI, S. & USUI, M., 1967. "Experimental studies on *Toxascaris leonina*. II. Diagnosis and treatment of toxascariasis in dogs and cats." *Jap. J. vet. Sci.*, 29 (5), 245-250. [Japanese summary p. 250.]

Several methods of detecting *Toxascaris leonina* eggs in faeces of dogs and cats were compared. A single examination by the dilution egg count, saline flotation and antiformin-ether methods was found to be satisfactory, but 3 direct smears were necessary to detect light infections. Administration of toluene at

0.2 ml. per kg. body-weight, *n*-butyl chloride at 1.0 ml. per kg., tetrachloroethylene at 0.2 g. per kg. and piperazine adipate at 0.24 and 0.36 g. per kg., to dogs experimentally infected with *T. leonina* showed *n*-butyl chloride, tetrachloroethylene and piperazine adipate to be effective against most of the worms, but (except in the case of piperazine adipate at 0.36 g. per kg.) a few immature worms remained. Piperazine adipate at 0.24 g. per kg. was very effective against *T. leonina* in 2 cats. D.A.Cz.

1080—NODA, R. ET AL., 1967. [Anthelmintic effect of methyridine preparations on canine whipworm.] *J. Jap. vet. med. Ass.*, 20 (4), 145-148. [In Japanese: English summary p. 148.]

[A number of anthelmintics were tested: dosages are not entirely clear from the English Summary.]

3211—OKOSHI, S. & MURATA, Y., 1968. "Experimental studies on ancylostomiasis in cats. VI. Visceral migration of larvae of *Ancylostoma tubaeforme* and *A. caninum* in dogs." *Jap. J. vet. Sci.*, 30 (1), 43-51. [Japanese summary p. 50.]

Puppies 2 to 8 weeks old were given oral doses of larvae of *Ancylostoma tubaeforme* or *A. caninum*, killed at intervals after infection, and examined for larvae. Recovery rates of *A. tubaeforme* larvae were 0 to 2.1%, of *A. caninum* larvae they were 60 to 80%. The larvae of *A. tubaeforme* disappeared gradually from the intestine; very few were found to have migrated to other organs and no development was observed. Larvae of *A. caninum* appeared to remain in the intestinal wall where they developed, eventually emerging into the lumen. Very few larvae were found in other organs. [See also No. 4285 below.] D.A.Cz.

3212—OKOSHI, S. & USUI, M., 1968. "Experimental studies on *Toxascaris leonina*. V. Experimental infection of dogs and cats with eggs of canine, feline and Felidae strains." *Jap. J. vet. Sci.*, 30 (2), 81-91. [Japanese summary p. 90.]

Toxascaris leonina (canine strain) developed to maturity in 33 of 37 dogs but no development occurred in cats. When cats were given 3rd-stage larvae of the canine strain obtained from tissues of mice, some development occurred and a few larvae reached maturity. A feline strain of *T. leonina* developed to maturity in both dogs and cats; prepatent periods were 50 and 62 to 63 days, respectively. Eggs of *T. leonina* obtained from cheetah, lion and tiger developed in both dog and cat. D.A.Cz.

3610—KAGEI, N.; KIHATA, M., 1971. [Anthelmintic effects of pyrantel pamoate against *Toxocara canis* and *Ancylostoma caninum* in dogs.] *Japanese Journal of Parasitology*, 20 (3), 222-227. [Ja, en] Div. of Parasitology, Inst. of Public Health, Tokyo, Japan.

The efficacy of pyrantel pamoate was compared with that of piperazine phosphate and bephenium hydroxynaphthoate against *Toxocara canis* and *Ancylostoma caninum* in dogs. 29 pups infected with *T. canis* were divided into 5 groups. Groups 1, 2 and 3 were given, respectively, pyrantel pamoate at 25, 12.5 and 6 mg. base per kg. body-weight, group 4 received piperazine phosphate at 100 mg. per kg. (as piperazine hydrate) and group 5 was left untreated. Complete cure rates (assessed 4 weeks after treatment) were 71.4, 33.3, 20.0, 16.7 and 0%, respectively. The corresponding figures for percentage reduction of worm burden were 91.7, 73.8, 64.3, 63.5 and 0%, respectively. In a separate experiment, 32 dogs infected with *A. caninum* were divided into 6 groups. Groups 1, 2 and 3 received a dose of pyrantel pamoate at 25, 12.5 and 6 mg. base per kg., groups 4 and 5 were given bephenium hydroxynaphthoate at 94 mg. and 47 mg. base per kg., respectively, and group 6 was left untreated.

Complete cure rates were 33.3, 40.0, 40.0, 20.0, 0 and 0%, respectively. The corresponding figures for percentage reduction in worm burden were 95.4, 91.1, 57.9, 20.5, 20.4 and 0%, respectively. [From English summary.] J.W.S.

3659—OKUGI, M.; ITO, Y.; KUSUNOKI, Y.; FURUYA, M.; DOI, M.; MAEDA, N.; OKA, Y.; OSAKI, H., 1971. [Effects of pyrantel pamoate on *Toxocara canis* and *Ancylostoma caninum* in dogs with reference to percent ova and worm reduction.] [40th Ann. Meeting J.S.P.,

Tokyo, 1971. Abstract.] *Japanese Journal of Parasitology*, 20 (4), 311-312. [Ja]

3660—OSAKI, H.; OKUGI, M.; ITO, Y.; KUSUNOKI, Y., 1971. [Effects of pyrantel pamoate on *Toxocara canis* and *Ancylostoma caninum* infections in dogs.] *Japanese Journal of Parasitology*, 20 (3), 188-194. [Ja, en] Dept. of Parasitology, School of Medicine, Tokushima Univ., Tokushima, Japan.

Pyrantel pamoate was tested against *Toxocara canis* and *Ancylostoma caninum* in dogs. An oral dose of 12.5 or 25 mg. per kg. body-weight reduced both egg and worm counts of *T. canis* by more than 90%, and 6 mg. per kg. reduced egg and worm counts by 63 and 81%, respectively. For *A. caninum*, an oral dose of 12.5 or 25 mg. per kg. gave nearly 99% reduction in both egg and worm counts, and 6 mg. per kg. gave a 96% reduction in both counts. The drug was well accepted with no noticeable side effects. [From English summary.] J.W.S.

3660—OSAKI, H.; OKUGI, M.; ITO, Y.; KUSUNOKI, Y., 1971. [Effects of pyrantel pamoate on *Toxocara canis* and *Ancylostoma caninum* infections in dogs.] *Japanese Journal of Parasitology*, 20 (3), 188-194. [Ja, en] Dept. of Parasitology, School of Medicine, Tokushima Univ., Tokushima, Japan.

Pyrantel pamoate was tested against *Toxocara canis* and *Ancylostoma caninum* in dogs. An oral dose of 12.5 or 25 mg. per kg. body-weight reduced both egg and worm counts of *T. canis* by more than 90%, and 6 mg. per kg. reduced egg and worm counts by 63 and 81%, respectively. For *A. caninum*, an oral dose of 12.5 or 25 mg. per kg. gave nearly 99% reduction in both egg and worm counts, and 6 mg. per kg. gave a 96% reduction in both counts. The drug was well accepted with no noticeable side effects. [From English summary.] J.W.S.

2457—SAKAMOTO, T.; ORIHARA, M.; SARASHINA, T.; ISHIMOTO, Y.; KAMIYA, H., 1971. [Studies on pharmacotherapy against larval and adult multilocular echinococcosis. 1. Anthelmintic and ovicidal effects of drugs against adult *Echinococcus multilocularis*.] *Jap. J. Parasit.*, 20 (2), 120-131. [Ja, en] Dept. of Parasitology, Faculty of Veterinary Medicine, Hokkaido University, Sapporo, Japan.

In Japan, dogs experimentally infected with *Echinococcus multilocularis* 20 days previously were given a single oral dose of arecoline hydrobromide, bithionol DS-6 (bis(2-hydroxy-3-nitro-5-chlorophenyl)sulphide), bunamidine hydrochloride, dichlorophen, dithiazanine iodide, kamala or Yomcesan. Bithionol at 150 mg. per kg. body-weight and bunamidine hydrochloride at 40 mg. per kg. were highly effective. 4 of 7 dogs which received DS-6 at 200 mg. per kg. died; 100% clearance of *E. multilocularis* was obtained in the other 3 dogs and in 2 that died. Arecoline hydrobromide at 2 mg. per kg. and kamala at 400 mg. per kg. were ineffective. Groups of 6 dogs were given bithionol at 200 mg. per kg., bithionol sulphoxide at 200 mg. per kg. or bunamidine hydrochloride at 40 mg. per kg. on days 20 and 22 or on days 20, 22 and 24 after infection with *E. multilocularis*. Complete clearance of *E. multilocularis* was obtained in all dogs which received 2 or 3 doses of bithionol sulphoxide and bunamidine hydrochloride. All the drugs tested in dogs, except dichlorophen and kamala, were examined for ovicidal effect; none was observed. [From English summary.] D.A.Cz.

3217—SUENAGA, O., ITOH, T. & NISHIOKA, T., 1971. [Studies on the filarial prevalence among dogs and the mosquito vectors in Nagasaki City, Western Japan. I. On the microfilarial prevalence among house dogs in Nagasaki City.] *Trop. Med., Nagasaki*, 12 (4), 169-178. [In Japanese: English summary pp. 169-170.]

Of 2,370 dogs examined in Nagasaki City, Japan, 690 were found to be infected with *Dirofilaria immitis* microfilariae. No microfilariae were found in dogs under one year, but microfilariae were found in over 10% of one-year-old dogs, and in 30 to 40% of dogs 3 years or older. The mean number of microfilariae per 20 cu. mm. blood was 52.3 in spring and 57.9 in autumn. It appears that more intensive transmission by the vector occurs in the suburban residential quarters than in the urban districts of the city. (From English summary.) C.W.G.

280—Japanese Journal of Veterinary Science.

- a. YOSIKAWA, M., MIYATA, I. & UESUGI, S., 1940.—"Supplement to Information about Trematode parasite on dogs in Kobe." 2 (4), 450-464. [In Japanese: English summary p. 464.]

(280a) In a further report on the trematode parasites of dogs in Kobe, Yosikawa, Miyata & Uesugi add the following 7 species and varieties: *Echinochasmus japonicus*, *Heterophyes heterophyes nocent*, *H. continuus*, *Metagonimus yokogawai ovatus*, *M. katsuradai*, *Monorchotrema yokogawai* and *Pygidioopsis summus*. P.A.C.

645—Journal of the Japanese Veterinary Medical Association.

1. ARAI, S., 1954.—[Survey of internal parasites of medium sized animals in Japan.] 7 (8), 382-384. [In Japanese.]

1373—Japanese Journal of Veterinary Science.

- *a. KUME, S. & ITAGAKI, S., 1947.—[Studies on *Dirofilaria immitis*. I. Observations on the life-cycle in the dog as the final host.] 9 (5/6), 119-130. [In Japanese: English summary.]

1418—Japanese Journal of Veterinary Science.

- *a. KUME, S. & ITAGAKI, S., 1949.—[Studies on *Dirofilaria immitis*. III. Prevention.] 11 (3/4), 53-61. [In Japanese: English summary.]

- g. OISHI, I. ET AL., 1957.—[Anthelmintic effects of four piperazine derivatives upon *Toxocara canis*.] 10 (11), 507-509. [In Japanese.]

553—Journal of the Japanese Veterinary Medical Association.

- a. ITO, R. ET AL., 1957.—[Experiments on anthelmintic effect of piperazine derivative upon intestinal parasites of puppies.] 10 (7), 306-307. [In Japanese.]

(553a) By administering 100 mg. of piperazine hydrate per kg. body-weight twice at 48-hour intervals to puppies, a piperazine derivative was found to be anthelmintically highly effective against ascarids, slightly effective against hookworms, and without effect against tapeworms. M.Y.

(553g) The anthelmintic effect of four piperazine derivatives, namely, the malate, the phosphate, the di-laurylsulphate and the sulphate, was found to be so rapid that *Toxocara canis* were still alive when evacuated from puppies. The minimum effective dose of the malate, the most effective derivative tested, was 100 mg. per kg. of piperazine base. Only the di-laurylsulphate produced any toxic side reactions in the host. M.Y.

- 1128—IRIE, T., 1958. [Department of Pathology, Tokushima University School of Medicine, Tokushima, Japan.] [Studies on *Gnathostoma* in eastern area of Shikoku.] *Shikoku Acta Medica*, 13 (2), 264-278. [In Japanese: English summary pp. 264-265.]

Studies on three species of *Gnathostoma* were carried out in the eastern area of Shikoku including Kagawa and Tokushima Prefectures from October 1955 to March 1958. Cats and

dogs were found as natural final hosts of *G. spinigerum* in Kagawa Prefecture. The infection rate was 7.2% in cats and 11.7% in dogs. 22 species of animals (six species of fish, two of amphibians, two of reptiles, 11 of birds and one of mammal) were established as natural second intermediate hosts of *G. spinigerum*. Out of 117 weasels (*Mustela sibirica itati*) examined, only one was a final host of *G. nipponicum*. The stomachs of 21 wild boars (*Sus scrofa leucomystax*) from Tokushima Prefecture were examined and all of them were infected with *G. doloresi* in their gastric walls. Dogs were successfully infected experimentally with larvae of *G. spinigerum* obtained from *Milvus migrans lineatus* and *Natrix tigrina tigrina*. Y. Yamao

- 618—MIYAZAKI, I. & KAMO, H., 1961. "The newest lung fluke in Japan, *Paragonimus miyazakii* Kamo, Nishida, Hatsushika and Tomimura, 1961." [Abstract.] *Journal of Parasitology*, 47 (4, Sect. 2), 51-52.

Paragonimus miyazakii from weasels and yellow martens in Kyushu and Honshu (Japan) and from a dog in Honshu is discussed. The metacercariae have been recovered from *Potamon (Geothelphusa) dehaani*. The author states that *Paragonimus miyazakii* is similar to *P. kellicotti* but has smaller eggs (73.4 μ $\times$ 43.8 μ on average) and their shells are generally thinner (1 to 2 μ). *Potamon dehaani* is also the intermediate host for *Paragonimus westermani*. M.B.B.

- 4726—WARNE, R. J., TIPTON, V. J. & FURUSHO, Y., 1969. "Canine heartworm disease in Japan: screening of selected drugs against *Dirofilaria immitis* in vivo." *Am. J. vet. Res.*, 30 (1), 27-32.

Diethylcarbamazine citrate was shown to prevent infection of dogs with *Dirofilaria immitis* when administered at the daily rate of 5.5 mg. per kg. body-weight, starting before and continuing for 30 days after the mosquito season ended, both under field and laboratory conditions in Japan. None of the other 8 drugs tested (including glycarsamide, several organophosphorus compounds, phenylbutazone and oxyphenbutazone) prevented infection with *D. immitis*. J.H.B.

4003—YOROZUYA, K. ET AL., 1968. [Epidemiological study of multilocular echinococcosis in eastern Hokkaido, Japan.] *J. Jap. vet. med. Ass.*, 21 (11), 471-476. [In Japanese: English summary p. 476.]

In eastern districts of Hokkaido, Japan, *Echinococcus multilocularis* was found in 18 of 641 dogs, 17 of 71 foxes (*Vulpes vulpes schrencki*) and in one of 156 voles. Although the infection rate was higher in foxes than in dogs, it is considered that the dog plays the more important role in infection of man. [From English summary.] D.A.Cz.

447—FURUKAWA, T., 1969. "Morphological variations in *Dipyllobothrium erinacei*." *Jap. J. Parasit.*, 18 (6), 553-556. [Japanese summary p. 556.]

Abnormalities in the segmentation, morphology and arrangement of the genitalia of *Dipyllobothrium erinacei* from dogs in Japan, are described. It is suggested that the abnormalities originate in the genital primordia of the young, post-cervical proglottides. A.J.

4078—KUGI, G., 1969. [A canine case of *Mesocostoides* sp.] *Jap. J. Parasit.*, 18 (5), 455-458. [In Japanese: English summary p. 458.]

Mesocostoides sp. (probably *M. litteratus*) from a dog in Japan is described and figured. P.S.G.

3362—PENNINGTON, N. E. & PHELPS, C. A., 1969. "Canine filariasis on Okinawa, Ryukyu Islands." *J. med. Ent.*, 6 (1), 59-67.

A survey of canine filariasis was made on Okinawa, Ryukyu Islands, Japan. Of 557 stray dogs examined, 23% were infected with *Dipetalonema reconditum*, one with *Dirofilaria immitis* and one with both species. Larvae of *Dipetalonema reconditum* were found in *Heterodoxus spiniger*, *Ctenocephalides canis*, *C. felis*, *Pulex irritans* and *Linognathus setosus*. Data are presented on the incidence of *D. reconditum*, the recovery of adult worms, the incidence of dog ectoparasites and infection in ectoparasites. The developing filarial forms are illustrated. A.J.

4337—TOMIMURA, T. ET AL., 1969. [Studies on paradoxical embolization with *Dirofilaria immitis* in dogs.] *Jap. J. Parasit.*, 18 (3), 265-280. [In Japanese: English summary pp. 279-280.]

Clinical and pathological findings of 6 dogs with systemic arterial embolism produced by the heart worm *Dirofilaria immitis* are given. Clinically the dogs had sudden lameness, terrible pain, coolness and necrosis of the soft tissues of their hind legs. Pathological findings showed the diameter of the patent foramen ovale to be from 0.2 to 0.8 cm. with an average of 0.39 cm. A single heart worm was discovered entering the foramen ovale. Parasitic embolism was found usually in the arteries of the pelvis and hind legs but in severer cases renal, hepatic, splenic, jejunal, testicular and common carotid arteries were involved. There was a correlation between the number of parasites and the severity of the cases. Post-mortem angiography of the lungs showed defective filling and thrombi in the pulmonary artery due to *D. immitis*. It is suggested that this might be the first description of paradoxical embolization caused by *D. immitis*. [From English summary.] K.H.

2532—YASUDA, F.; NISHIKAWA, H.; UJIHASHI, M.; WATANABE, S., 1969. [Studies on the life-history of *Dipylidium caninum* (Linnaeus, 1758). II. The ecology of the mature proglottides and the application of the diagnostic cellophane tape method.] *Bull. Nippon vet. zootech. Coll.*, No. 18, pp. 122-128. [Ja, en]

Observations that a proportion of the mature proglottides of *Dipylidium caninum* creep out of the anus of the dog and move around scattering egg capsules on the skin led the authors to use a cellophane tape method for diagnosis. 47.1% of stray dogs in a compound were found to be positive by this method, a figure similar to that obtained at post-mortem examination of similar dogs 10 years previously. Eggs of *Toxocara canis* and *Trichuris vulpis* were also detected. [From English summary.] D.A.Cz.

*2235—INTERMILL, R. W.; FREDERICK, R. M., 1970. "A study of potential mosquito vectors of *Dirofilaria immitis* Leidy, on Okinawa, Ryukyu Islands." *J. med. Ent.*, 7 (4), 455-461. [En]

In the Ryukyu Islands, Japan, dogs imported for guard duties were apparently more heavily infected with *Dirofilaria immitis* than local dogs. *D. immitis* microfilariae were found in wild-caught blood-fed

females of *Culex pipiens fatigans*, *C. tritaeniorhynchus*, *C. vishnui*, *Anopheles sinensis*, *Aedes vexans*, and *Mansonia uniformis* collected from imported dog compounds. Infective-stage larvae were recovered from wild-caught, engorged females of *M. uniformis* and *C. tritaeniorhynchus* when these were kept in the laboratory for 16 to 22 days before dissection. Percentages of mosquitoes found with infective-stage larvae after being fed experimentally on an infected dog are given for each species. The authors discuss the local epizootiology of *D. immitis* in the light of these results. [From *Trop. Dis. Bull.*, 68, No. 840.] M.R.N.S.

3578—FOWLER, J. L.; FURUSHO, Y.; FERNAU, R. C., 1971. "Further testing of fenthion for prophylactic effects against the developing stages of *Dirofilaria immitis*." *South-east Asian Journal of Tropical Medicine and Public Health*, 2 (4), 466-468. [En] Dept. of Veterinary Medicine, 406th Medical Laboratory, U.S. Army Medical Command, Japan.

In Japan, 12 dogs were given a single dose of 100 infective *Dirofilaria immitis* larvae by subcutaneous injection and then received fenthion at 5.5 mg. per kg. body-weight in the food, 6 days a week for 160 days. At autopsy 180 days after infection, no adult heartworms were found in any of the dogs. An average of 26.3 was found in 6 control dogs which did not receive fenthion. D.A.Cz.

3330—NAKAMURA, T., 1971. [Coiling of canine filariae around chordae tendineae in dogs.] *Journal of the Japanese Veterinary Medical Association*, 24, 355-358. [Ja, en] Dept. of Pathology, Veterinary School, Tokyo Univ. of Agriculture and Technology, Japan.

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- 4 Humpsores (*Stephanofilaria*) in domestic animals.
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